FWT fluid and water technology

BUILT-IN ELECTRONIC TIMERS
Series 884

- Electronic built-in timers with day and week programming.
- 1 channel allows a precise minute switch off, single days or block programming (e.g: Monday to Friday)

Safety Instruction
○ Always turn off the power during repair work.
○ 220-240V ~ life threatening voltage.
○ The Diehl 884 built-in timer should only be installed by a person with the relevant qualifications.
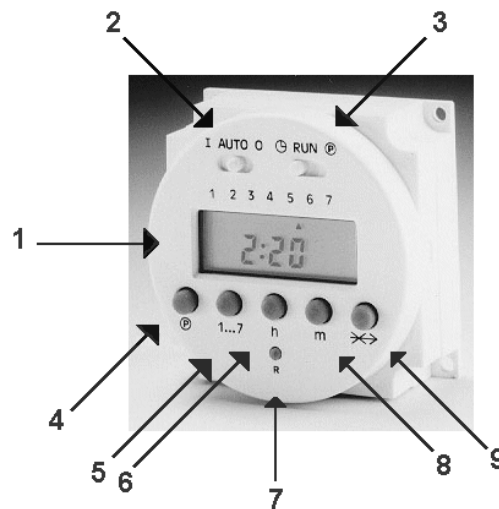
Operating and visual elements

Abb. 1: Operating and visual elements

1   Display with time, switch points.
2   Slide switch to set the operation mode.
       AUTO: The timer will switch on and off according to the selected programme.
        I: Permanently on   permanently override
        O: Permanently off
3   Slide switch to set the time and switching times
       RUN: Operator mode

   (L) : Input actual time and set mode

   (P) : Programme mode

4   (P) : Press down the button marked (P) to set the 16 switching points. When the program mode is
set the light symbol will appear on the right hand side of the display screen.
       If the switching points 1, 3, 5, 7, 9, 11, 13, 15 are activated, light symbol will appear on the display.
These positions are the ON time/start positions.

5   (1..7) : Press down the button marked (1 to 7) to set the days of the week and block programming e.g.
1..5 (Monday to Friday)
1..6 (Monday to Saturday)
6..7 (Saturday to Sunday)
1..7 (Monday to Sunday)

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Operation manual

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6 (HR) : Press down and release the button marked (HR) to set the hours. (for actual time of day and switching times).

Short press of the button market (HR) results in the timer counting one up.

Pressing down the button marked (HR) for longer than 3 seconds results in fast forward counting.

7 (R) : Press down the reset button in order to erase all switching times and actual time of day.

8 (MIN) : Press down the button marked (MIN) to set the minutes. (for actual time of the day and switching times).

Short press of the button marked (MIN) results in the timer counting one up.

Pressing down the button marked (MIN) for longer than 3 seconds results in fast forward counting.

9 (↤↦) (Skip-Function) – or soft override

By pressing down the (↤↦) Skip-button the timer will be switched into the opposite functional mode.
For example the relay is switched on. By pressing down the button marked skip; the timer will be switched off.

Programming

Before programming a reset is required. It can be done by pressing down the reset button with a thin instrument. The slide switch must be set in "RUN" mode. The display will begin to blink.

Setting the time and day

Slide the switch into (L) position. Setting the time can be done by pressing down the (HR) and (MIN) buttons. When the buttons are held down for a period longer than three seconds the fast forward setting is activated.

Setting the days of the week is done by pressing down the button marked (1..7) e.g. (1=Monday 7=Sunday). An arrow will appear on the screen indicating the day of the week.

```
1 2 3 4 5 6 7

        ▲
  9 : 00
```
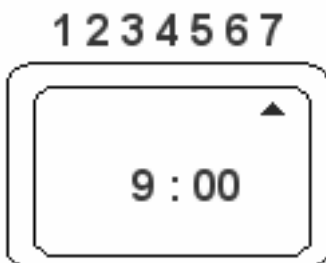
After completing the above programme, set the slide switch to "RUN" and the time of day will be activated.

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Setting the time and day

Set the Slide switch into position ⓟ.

By pressing down the buttons ①...⑦ it is possible to set the day. Likewise block programming procedure is also possible.

The next programming procedure can be recalled by pressing down the button marked ⓟ. There are also 16 switching points in total which can be stored on memory (8x ON, 8 x OFF). The number and symbol on the display screen indicated which mode has been selected.

ON

OFF

After the input on the switching times, it is necessary to slide the AUTO and RUN switches into the correct positions in order to activate the programmed sequence.
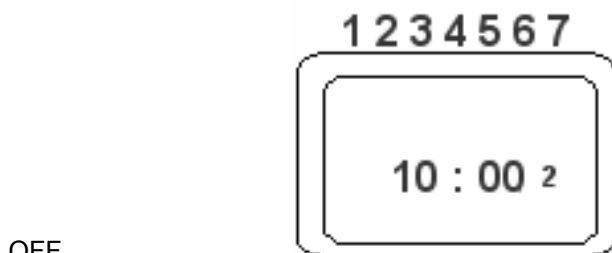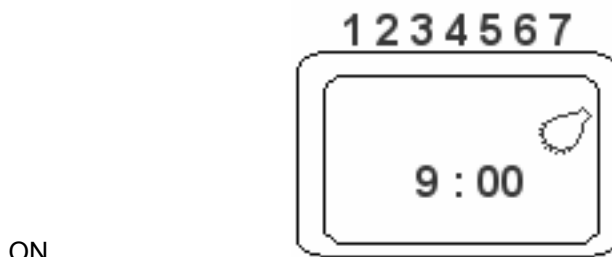
–x→ (Skip-Function)

Set the slide switch into RUN mode.

By pressing down the skip button ⨝↔ the timer will automatically be switched into the opposite operational mode.

For example the timer is in operational mode (ON). Therefore by pressing down the Skip-button ⨝↔ the operational mode will be reversed.

When the skip function is activated the skip symbol (–x→) will appear on the display.
Pressing down the skip button again will cancel the skip function.

Switching times, changes and correlation

Slide the switch to the position marked ⓟ. It is possible to use the button marked ⓟ to recall the information which has been saved. To erase a programmed switch point it is necessary to press down the buttons which are marked as **9** and **4** on the second page of the operation manual. This process will delete the switching points.

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Programming mistakes
Possible programming failures
- a)   Switching programme
  Daily or block programming
  - Next switching off programme
    - *No input*
- b)   Switching programme
  No input
  - Next switching off programme
    - *Daily or block programming*
- c)   Switching programme
  Block programming, e.g. 1, 2, 3, 4, 5.
  - Next switching off programme
  Block programming of a different kind, e.g. 1, 2, 3, 4, 5, 6.
- d)   Switching programme
  Block programming
  - Next switching off programme
    - *Daily programming*
- e)   Switching programme
  Programmed switching on times, e.g. Wednesday 9:00 H
  - Next switching off programme
  Programmed switching off times, e.g. Wednesday 8:59 H
- f)   Switching programme
  Programmed switching on times, e.g. Wednesday 9:00 H
  - Next switching off programme
  Programmed switching off times, e.g. Wednesday 9:00 H

Technical Data
- ○   Day and week programming possibilities.
- ○   16 switching possibilities (8 x ON, 8 x OFF),
  By block programming there is a total of 56 different programming possibilities.
- ○   Shortest time between two switching points is 1 minutes.
- ○   Programmed memory of up to 5 year due to Lithium battery.
- ○   Mains voltage: 220-240V ~ life threatening voltage.
  - ○   switch rating: Ohmic 10 (A)/250 V
  - ○   inductive: 4 (A)/250 V ~ (ind.)
- ○   Ambient temperature range: 14°F bis + 132°F (T55)

Guarantee
There is a 12 month guarantee for any of the components of the Diehl 884 built-in timer.
Any damage to the 884 series which occurs due to mishandling is under no circumstances covered by a 12 month guarantee.

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ELECTRONIC DIGITAL TIMER
884 SERIES
<u>USER MANUAL</u>
<u>Operation / Function Description Series 884</u>

1.   <u>Power up conditions:</u>

a)   Upon rest (R) you will see that the display blinks. Make sure slide switch is in "RUN" position before reset.

```
1 2 3 4 5 6 7
        ▲
   0 : 00
```
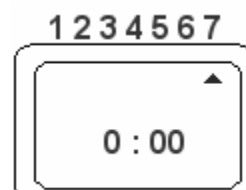
b)   Upon rest, if the slide switch is at (P), you will see error message "EEE". Push slide switch to "RUN" position to clear the error message.

```
1 2 3 4 5 6 7
        ▲
   EEE
```
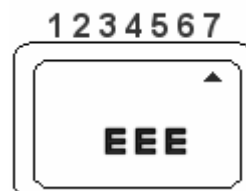
c)   Push slide switch to (L) position and you will see a stable display.

```
1 2 3 4 5 6 7
        ▲
   0 : 00
```
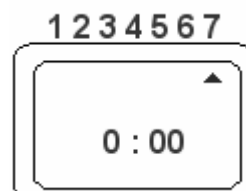
d)   Push slide switch to "RUN" position and you will see a stable display with the colon blinking.

```
1 2 3 4 5 6 7
        ▲
   0 : 00
```

e)   Push slide switch to (P) position and you will see a stable display.

```
1 2 3 4 5 6 7

   0 : 00 ₁
```

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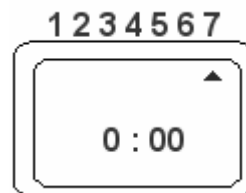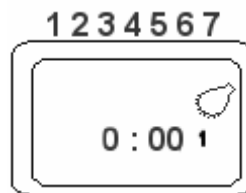
2.   Manual Control:

Slide switch to "I" position.
> - Lamp symbol appear on LCD
> - Output switches to ON and remains ON

Slide switch to "O" position.
> - Lamp symbol disappear on LCD
> - Output switches to OFF and remains OFF

Slide switch back to "AUTO" position.
> - Program control is resumed. The status of the output depends on previous programs you have set.

3.   Set time function description:

For example, to set the time to Wed 3:16 pm with the factory present at 24-hr version. First slide switch to set time position ⬤.

a) Set calendar day – press day button (1..7) to advance the triangular day indicator from 7 (Sunday) to 3 (Wednesday). When the button is stressed, the triangle advances one step. If the button is not released in 1 second, the triangle continues to advance at the rate of 1 step per second until release.
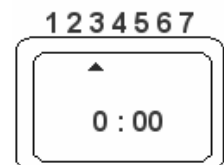
b) Set hour/minute – press hour (HR) and (MIN) buttons to advance hour/minute setting to 15/16. When the button is pressed, the hour/minute setting will advance one step. If the button is not released in 2 seconds, the setting will continue to advance at a fast rate of 8 steps per second.
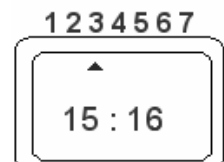
4.   Set program function description:

For example, to set program no. 3 to switch on at p:03 on Wed, program no. 4 to switch off at 11:04 on Wed, program no. 17 to switch on at 19.53 for "all-day", and program no. 18 to switch off at 23.54 for "all-day". First slide switch to set program position, then

a) advance program selection to program no. 3 with (P) button - (P) button advances program number 1 step at each activation. Program 3 is initially cleared (with no triangular day indicator) and the setting time will initially be 0:00.

b) press day button to set day=3 – press (1..7) button to advance day setting from NONE, 7..3. The fast-advance feature during set-time mode also exists.

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c) press (HR) to set hour=9 – press (HR) button to advance setting from 0 to 9.

```
 1 2 3 4 5 6 7
┌───────────┐
│    ▲      ◯│
│  9 : 00  3 │
└───────────┘
```

d) press (MIN) button to set min=3 – press (MIN) button to advance setting from 00 to 03.

```
 1 2 3 4 5 6 7
┌───────────┐
│    ▲      ◯│
│  9 : 00  3 │
└───────────┘
```

e) press program button (P) to advance to program no. 4.

```
 1 2 3 4 5 6 7
┌───────────┐
│    ▲       │
│  0 : 00  4 │
└───────────┘
```

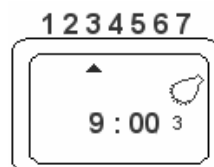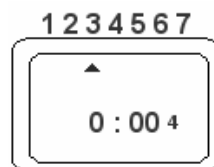f) press (1..7) day button to set day=3 – press (1..7) button to advance day setting from NONE, 7..3. The fast-advance feature during set-time mode also exists.

```
 1 2 3 4 5 6 7
┌───────────┐
│           │
│  0 : 00  4 │
└───────────┘
```
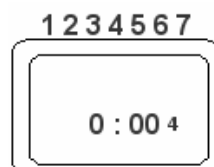
g) press (HR) to set hour=11 – press (HR) button to advance setting from 0 to 11.

```
 1 2 3 4 5 6 7
┌───────────┐
│    ▲       │
│ 11 : 00  4 │
└───────────┘
```
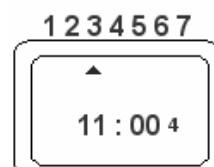
h) press (MIN) button to set min=04 – press (MIN) button to advance setting from 00 to 04.

```
 1 2 3 4 5 6 7
┌───────────┐
│    ▲       │
│ 11 : 04  4 │
└───────────┘
```

i) press program button (P) to advance to program no. 17.

```
 1 2 3 4 5 6 7
┌───────────┐
│          ◯│
│  0 : 00 17 │
└───────────┘
```

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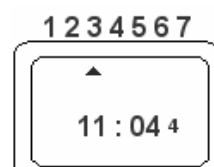
j) press (1..7) day button to set day ="all-day" – press (1..7) button to advance day setting from NONE, 7, 1..6, 1..5, 6 7, 1..6 and to all day 1..7. The fast-advance feature similar to that shown in 3(a) also exists.

```
1 2 3 4 5 6 7
▲ ▲ ▲ ▲ ▲ ▲ ▲
           0 : 00 17
```
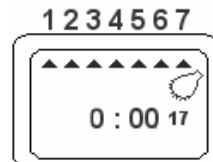
k) press (HR) to set hour=19 – press (HR) button to advance setting from 0 to 19.
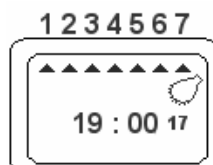
```
1 2 3 4 5 6 7
▲ ▲ ▲ ▲ ▲ ▲ ▲
          19 : 00 17
```

l) press (MIN) button to set min=53 – press (MIN) button to advance setting from 00 to 53.

```
1 2 3 4 5 6 7
▲ ▲ ▲ ▲ ▲ ▲ ▲
          19 : 53 17
```

m) press program button (P) to advance to program no. 18.

```
1 2 3 4 5 6 7

           0 : 00 18
```
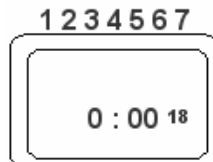
n) press (1..7) day button to set day ="all-day" – press (1..7) button to cycle day setting from NONE, 7, 1..6, 1..5, 6 7, 1..6 and to all day 1..7. The fast-advance feature similar to that shown in 3(a) also exists.
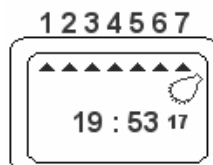
```
1 2 3 4 5 6 7
▲ ▲ ▲ ▲ ▲ ▲ ▲
           0 : 00 18
```
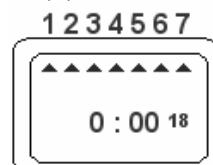
o) press (HR) to set hour=23 – press (HR) button to advance setting from 0 to 23.

```
1 2 3 4 5 6 7
▲ ▲ ▲ ▲ ▲ ▲ ▲
          23 : 00 18
```
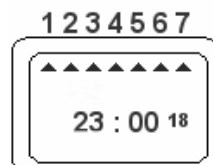
p) press (MIN) button to set min=53 – press (MIN) button to advance setting from 00 to 53.

```
1 2 3 4 5 6 7
▲ ▲ ▲ ▲ ▲ ▲ ▲
          23 : 54 18
```
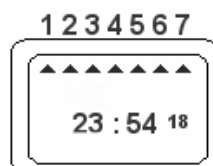
q) press program button (P) again to review program settings.

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5.   Skip function setting and operation Manual Control:

-    Set slide switch at RUN position

-    Press skip ⊕ button to skip program control (soft-override). The skip function brings forward just the actual status from ON to OFF and vice versa, continuing with the normal set program at the next ON/OFF. A "cross over an arrow"-symbol (skip symbol ⊕) appears on the LCD to indicate this status.

```
1 2 3 4 5 6 7
   ▲
15 : 16 ⤧
```
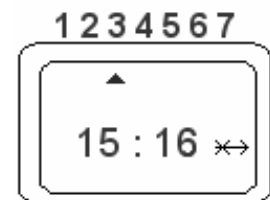
-    Press and release the skip button again to disable the skip function, if it was enabled. The skip symbol disappears to reflect the cancellation. Output status will then resume to the auto output status determined by those valid program settings. **The skip function will be disabled automatically upon the next programmes ON / OFF will be reached.**

```
1 2 3 4 5 6 7
   ▲
15 : 16
```
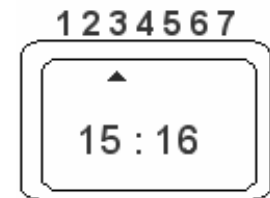
⟹ Skip function may be selected only at RUN mode.

⟹ Skip function may be enables / disables with the skip button.

⟹ Skip indicator ⊕ shows whether skip function is enabled.

6.   Error message display

There are two types of error display. One of the examples is shown in selection 1b. This happens when an attempt is made to set a program before the time is initialised first by sliding the switch to set time mode upon reset.   The other type of error display is for indicating a program entry error.

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7. Invalid program entry

The following program entries could invoke this error message:

a) ON program	- daily or block programming
next OFF program	- no entry or NONE
b) ON program	- no entry or NONE
next OFF program	- daily or block programming
c) ON program	- block programming of one type, e.g. 1 2 3 4 5
next OFF program	- block programming of one type, e.g. 1 2 3 4 5
d) ON program	- block programming
next OFF program	- daily programming
e) ON program next OFF program	Programmed time: - ON e.g. at 9:00 on Wed - OFF e.g. at 8:59 on Wed (Time to turn on is later than time to turn off of the same day)
f) ON program next OFF program	Programmed time: - ON e.g. at 9:00 on Wed - OFF e.g. at 9:00 on Wed (Time to turn on is the same as time to turn off of the same day)

8. Correct program entry

The following program entries are acceptable:

a) ON program	- daily programming
next OFF program	- block programming
b) ON program	- daily programming
next OFF program	- daily programming
c) ON program	- block programming of one type, e.g. 1 2 3 4 5
next OFF program	- block programming of same type, e.g. 1 2 3 4 5
d) ON program next OFF program	Programmed time: ON e.g. at 8:59 on Wed OFF e.g. at 9:00 on Wed
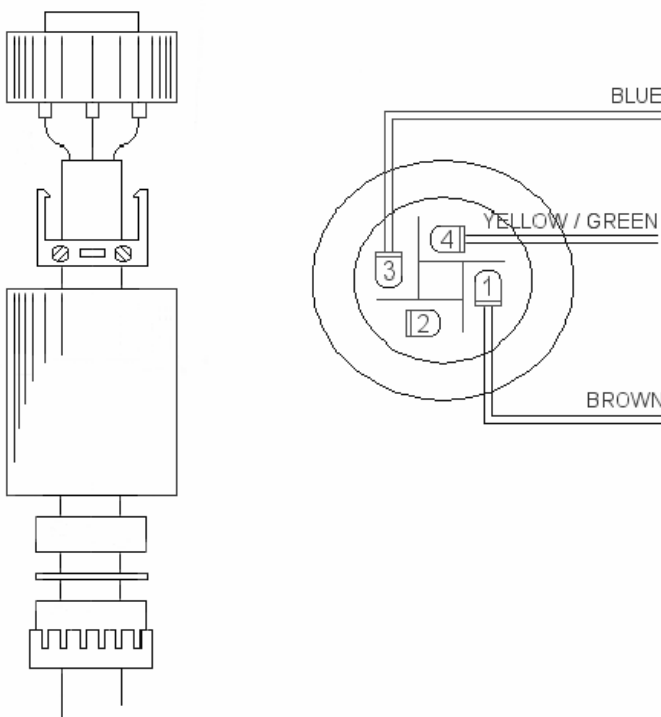
Figure 4 Wiring diagram for pump cable and utility connections.
1) Cut the mains cable to size
2) Dismantle the connector and then slip the individual pieces over the cable, making sure they are in the right order.
3) Peel a short length of the cable sheath and bare the constituent leads, all as shown in the drawing above.
4) Connect the cable leads to the connector, respecting the above pin/colour pattern.
5) Reassemble the connector.

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Further hints and warnings

Please read the warning notices given in this section very carefully, because they provide important information regarding safety in installation, use and maintenance of the controller.

- Keep this manual in a safe place, so that it will always be available for further consultation.
- After unpacking the unit, make sure it is completely sound. In case of doubt, do not use the controller and contact qualified personnel. The packing materials (especially bags made of plastics, polystyrene, etc.) should be kept out of the reach of children: they constitute potential sources of danger.
- Before you connect the controller, make sure that the voltage ratings, etc., correspond to your particular power supply. You will find these values on the rating plate attached to the pump.
- The controller should be used only for the purpose for which it has been expressly designed, namely the controlling and measuring physical-chemical values. Any different use is to be considered improper and therefore dangerous. The makers cannot be held responsible for damage deriving from improper, erroneous or unreasonable use of the unit.
- Use of electrical equipment always implies observance of some basic rules: In particular:
    1-do not touch the equipment with wet or damp hands or feet;
    2-do not operate the pump with bare feet (Example: swimming pool equipment);
    3-do not leave the equipment exposed to the action of the atmospheric agents;
    4-do not allow the pump to be used without supervision by children or incompetent people;
- Before carrying out any maintenance or cleaning operation, disconnect the unit from the power supply by means of the circuit breaker.
- In case of breakdown or improper functioning of the controller, switch it off, but do not touch. Contact our technical assistance for any necessary repairs and insist on the use of original spares. Failure to respect this condition could render the unit unsafe for use.
- When you decide to make no further use of an installed controller, make sure to disconnect it from the power supply.
- The electrical installation to which the controller is connected must comply with the standards and good practice rule in force in the country under consideration.
- The pump complies with EEC directives No.89/336 regarding "electromagnetic compatibility" and No.73/23 regarding "low voltages", as also the subsequent modification No.93/68.
- Maximum environmental operating temperature: 40°C.

N.B. The controller has been constructed in accordance with best practice. Both its life and it electrical and mechanical reliability will be enhanced if it is correctly used and subjected to regular maintenance.

WARNING: Any intervention or repair in the interior of the pump must be carried out by qualified and authorized personnel. The makers decline all responsibility for the consequences of failure to respect this rule.